

174. *On a New Carboniferous Brachiopod Fauna from the Ashio Mountains, Japan.*

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On the southern side of the Ashio Mountains, in the province of Shimotsuke, there are several localities where Paleozoic limestones expose. In these localities we can often collect plenty of washed-out shells of *Fusulina* (mostly *F. kairimizensis* OZAWA),¹⁾ sometimes in association with some other fossils. In one of these limestone localities which is popularly known as the limestone quarry of Nabeyama, where limestone is cut out for the use of the Ashio mines, Mr. KISHI, a geologist of that mine, happened to get a few large specimens of a species of brachiopod. These specimens were kindly given to me for study. I have found that these specimens represent a species *Schizophoria resupinata* (MARTIN) DAVIDSON which is very common in the Carboniferous faunas of various parts of the world.

Having discovered the material very interesting from the view point of historical geology, I made an excursion to the locality, by the aid of the Saitô Gratitude Foundation, in order to get something more for the investigation. The journey was a hurried one, having taken place late in the autumn of 1925, but fortunately I could find some other species that are quite well preserved.

The name Nabeyama was once mentined by Dr. HARADA, in his "Die japanischen Inseln"²⁾ as one of the then known localities of *Fusulina*. It is described thus: "Im Kohlenkalk von Nabeyama (Provinz Shimotsuke) an der Südseite des Ashiogebirges, welcher durch seinen Reichthum an Krinoiden und Fusulinen ausgezeichnet ist, soll einmal ein *Bellerophon*, ähnlich dem von Akasaka, gefunden worden sein." This has been our knowledge concerning the fossils of this locality. All what I obtained in this locality are brachiopods, however.

1) OZAWA:—Paleontological and Stratigraphical Studies on the Permo-Carbon. Limestone of Nagato, II. Paleontology, p. 31, pl. IV., fig. 5. 1925.

2) T. HARADA:—Die jap. Inseln, eine topogr.-geolog. Uebersicht. p. 70, 1890.

The limestone of Nabeyama exposes along a small valley, giving an aspect of a gorge, a few kilometers west of the place called Nabeyama. The limestone gorge runs from N.W.-S.E., and the limestone strikes almost W.-E., with a moderate southward dip. In the gorge we see that the lower portion of the wall is black in colour and to some extent bituminous, while higher up the rock is of a lighter colour. These two kinds of limestones seem to be continuous, i.e., they do not appear to be unconformable to each other. It is from this lower, black, bituminous mass of limestone that my brachiopod fauna was yielded. In this brachiopod-limestone I have not been able to find *Fusulina*: it was first discovered on climbing up the gorge-wall southward; that means, the *Fusulina*-limestone, which is of a gray colour as mentioned above, lies at a few scores of meters above the black bituminous limestone. The brachiopods seem to occur in quite a limited thickness of the bituminous limestone.

The list of the brachiopods from this locality is as follows:

Productus punctatus MARTIN

Meekella eximia EICHWALD *forma majuscula* nov. nom.

Orthotetes simensis TSCHERNYSCHEW

Schizophoria resupinata (MARTIN) DAVIDSON

Spirifer aff. *rockymontanus* MARCOU

Reticularia lineata MARTIN

The fauna as whole is represented by quite well preserved specimens. It is particularly worthy of note that some of the specimens are unusually large in size. *Meekella eximia*, in the first place, is about 90 mm. long and about 115 mm. wide. Although this species is known to grow quite large sometimes, the larger one figured by TSCHERNYSCHEW¹⁾ is not more than 45 mm. in length: one of the specimens described by YAKOWLEW²⁾ is hardly 50 mm. TRAUTSCHOLD recognizes that this species often attains a large size³⁾, his specimens⁴⁾ do not seem to surpass in size that of TSCHERNYSCHEW. Next is *Schizophoria resupinata* that is to be considered in this respect. All the four specimens I have are quite large, and the largest one is somewhat larger than the largest of DAVIDSON's material⁵⁾ mentioned in his monograph.

1) TSCHERNYSCHEW:—Die obercarb. Brachiop. d. Ural u. d. Timan, pl. LL, fig. 13. Mém. Com. Géol. XVI, 1902.

2) YAKOWLEW:—Die Fauna d. ob. Abt. d. pal. Abl. in Donez-Bassin, pl. II., Fig. 3. Mém. Com. Géol. n. ser. 79. 1912.

3) TRAUTSCHOLD:—Die Kalkbr. v. Mjatschkowa, p. 346, 1878 (*Orthis eximia*).

4) *ditto*, pl. XXXIV., Fig. 4; pl. XXXV., Fig. 1.

5) DAVIDSON:—Monogr. II., Pl. XXIX., Fig. 2.

Spirifer aff. *rockymontanus* is represented by two, more or less strongly deformed examples. They can not be identified with this North American Upper Carboniferous species¹⁾; they resemble the North American forms in the general features, but the radial ribs are far less numerous. They may perhaps represent a new species, or a new variety of the group of *Spirifer rockymontanus*. The species under consideration also resembles *Spirifer trigonalis* MARTIN of some authors²⁾.

The list of this fauna shows that it contains characteristically Carboniferous forms, but not a member of such Permian forms as I have hitherto described from the Kitakami mountains and elsewhere. Some of the species of the new fauna range from Lower Carboniferous up to Permian, while some others are Upper Carboniferous forms. In the higher *Fusulina* horizon it seems *Fusulina kairimizensis* is quite abundant. In this determination is right, the brachiopod horizon must be older than the limestone of Hanawa, which contains, together with *Fusulina kairimizensis* a very excellent specimen of *Helicoprion* as was reported by Prof. YABE³⁾ some years ago.

This study has been carried out by means of the scholarship given me by the Saitô Gratitude Foundation of Sendai. The details are to be reported in future. This preliminary report is concluded with thanks to that Foundation.

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1) Girty:—The Carb. Form. and Faunas of Colorado, p. 383, U.S. Geol. Survey Prof. p. 16, 1903: etc.

2) Diener:—The Anthrac. Faunae of Kashmir, Kunaor and Spiti, p. 40, pl. IV., Figs. 7, 8; p. 129, pl. LI., Fig. 29. Pal. Ind. New Ser. V., 2, 1915.

3) Yabe:—On a *Fusulina*-Limestone with *Helicoprion* in Japan. Jour. Geol. Soc. Tôkyô, vol. X, 1903.